

Esri SMART COMMUNITIES

CASE STUDY SERIES



Photo: Vern Lindemann

CARVER COUNTY

THE BENEFITS OF GIS FOR ALL

Carver County, Minnesota

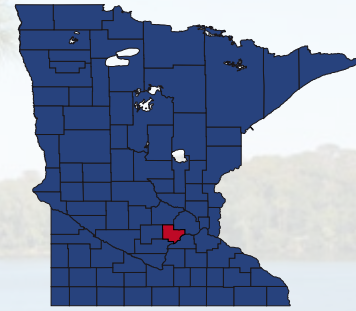
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COMMUNITY PROFILE: Carver County, Minnesota



Population Size: 97,162 (2014 US Census estimate)

GIS Program: Hybrid (Centralized and Decentralized)

Number of Departments Using GIS: All

Total FTEs: 4 plus a summer intern

Core GIS Budget: \$546,793

What Is a Smart Community?

Local governments are looking for ways to build safe, healthy, resilient communities for their constituents. Citizens are calling on governments to be more transparent, efficient, collaborative, and productive. A government that meets these challenges is a **Smart Community**. How will you strive to meet these needs?

Technology is the defining factor for a smart community. It is modern technology that enables departments to increase communication, effectiveness, and openness. Technology gives governments and their citizens access to powerful information that they can leverage to make more informed decisions.

Smart Communities promote efficiency. Time no longer has to be wasted in duplication of efforts by different staff. Departments can now share relevant and timely information throughout the organization, helping staff across all departments collaborate and deliver a higher level of service. With a common information system like GIS, staff have access to the tools they need to create, manage, and share authoritative information and applications.

It doesn't matter how big or small your community is, where you are located, or how unique your needs may be, **any** community can be a Smart Community.

THE BENEFITS OF GIS FOR ALL

Carver County, Minnesota

Carver County was an early adopter of GIS technology, first implementing a system in the mid-1990s. Initially, there were a small number of users; these were in departments that focused on land use. Over time, however, the use of GIS spread throughout the county. GIS was presented as a service that provided an enterprise-wide platform with access to centralized data for all departments.

In 2000, Carver County's Information Technology Department began a push to expand GIS technology to all departments. A few county departments had changes in leadership that opened up new opportunities to invest in GIS technology, resulting in more top-down support for the technology in those departments. The need to collect data on county assets and public infrastructure maintenance led to new work assignments. The introduction of Esri's ArcGIS Online – a collaborative web GIS that allows users to create and share maps, scenes, apps, layers, analytics, and data – in 2009 greatly enhanced the expansion effort.

One of the first tasks undertaken at this stage was to take existing county technology, processes, and procedures and make them mobile. This enabled county field crews to use new applications on smartphones and tablets. No longer were data collected in the field on paper forms and later loaded into a spreadsheet for analysis; now they were collected directly into a database, and new data layers were created. Data were automatically synced in the system, eliminating most paperwork and achieving a higher degree of accuracy.

The Growth of New Users

The growth in county personnel using GIS has been extremely rapid: from 15 desktop users before the introduction of ArcGIS Online to 175 active accounts after implementation. Several county departments – Land Management, Planning and Water Management, Environmental Services, Emergency Management, Public Works, Sheriff, Property and Financial Services, Information Technology,



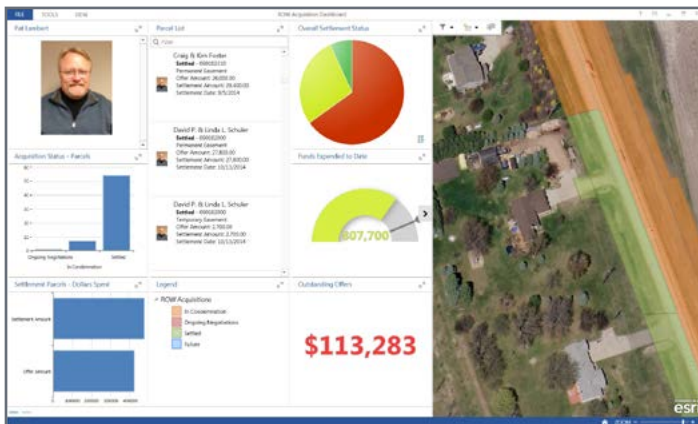
The county has benefited from up-to-date locational data for county assets and infrastructure.

Health and Human Services, Facilities, and Employee Relations – depend on maps for their work, for example; Public Works uses maps for establishing infrastructure maintenance plans. Among these departments are about thirty people who are classified as power users and serve as resident GIS experts within their own departments.

Why has this interest and growth in GIS occurred? County staff made a conscious effort to assess the business needs of departments and brainstorm how GIS applications could help meet those needs. As employees saw how others were using GIS, they began coming up with their own ideas for using GIS in their departments.

County Applications

A high demand for data collection existed among several county departments. As personnel recognized the value of GIS technology for managing workloads, they advocated for access to that technology for their departments. The Assessor's Office was among the first departments to embrace GIS. The manual processes that the department had been using to store property photos, taxation data, and evaluation data were quite lengthy and time-consuming. The new automated business processes enabled staff to upload data into GIS while they were in the field, thus improving their efficiency and freeing up time for other activities.



Pictured is a dashboard for right-of-way acquisition projects.

Water management data collection was another priority area. The county's Planning and Water Management Department has implemented six applications, all collector driven, for improved water management. Having locational data on such items as septic systems, sewer lines, and soil borings has been especially helpful from an environmental management perspective. Knowing what is underground helps the county stay compliant with state regulations; it also speeds up the permitting process for homeowners and developers. Having the GIS database helps protect the county in case issues ever go to court. It is also helpful for simply looking up data — for example, a recent water quality analysis.

Public Works has become one of the heaviest users of GIS technology. Significant organizational changes in the department have created an environment where GIS use has expanded rapidly. First, a progressive director who was visually oriented and interested in using maps to communicate county plans took over department leadership. Then, staffing changes in 2010 dramatically changed the culture of Public Works: remaining staff

had a vested interest in technology to improve business processes and overall efficiency. This was followed by a reorganization that created two dedicated GIS positions within the department. Since then, Public Works has leveraged GIS technology to better maintain the county's existing infrastructure, using it to accomplish traditional asset management tasks, document the location of publicly owned assets around the county, and establish a maintenance program for those assets.

Some of the GIS projects undertaken by Public Works help manage work. The department uses Web AppBuilder, Collector, and Operations Dashboard to plan, schedule, and manage traffic counts, Public Land Survey System monument maintenance, and MS4 (storm sewer) compliance inspections. Mobile GIS also supported a curve study focused on sign placement; after the study identified unnecessary curve signs, many signs were removed and a significant savings was realized. When the county needed to replace 1,200 signs that were widely dispersed, it contracted with a sign installer and used maps and apps to efficiently track the installer's work progress, inspect the installer's work, and ensure that postinstallation data maintenance was completed.

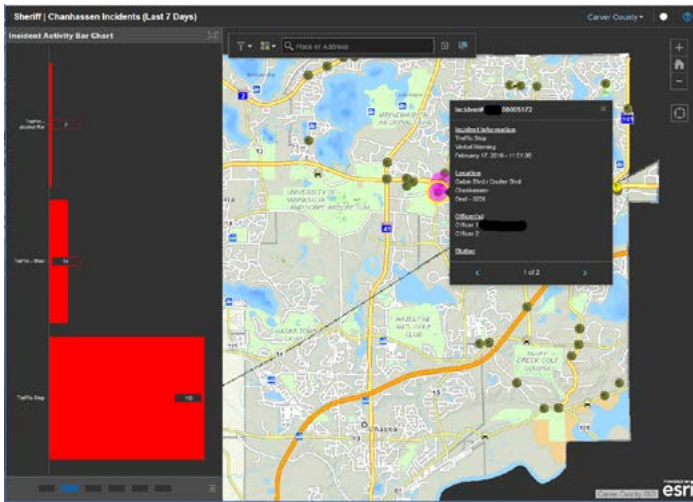
The Right-of-Way Department implemented an Operations Dashboard solution as a way to track and report the status of acquisition projects to upper management and showcase staff performance.

Highway prioritization has been another important area of GIS. The county has used GIS to capture roadway characteristics, which, coupled with performance measures such as safety, congestion, geometric deficiencies, and project readiness, help to establish priorities for future roadway projects and secure sufficient funding.



Field crews can enter locational data directly into the county's GIS system while in the field rather than having to wait until they return to the office.

The Sheriff's Office is increasingly turning to GIS technology for its work. For example, staff wanted an application that would provide them with easy access to crime maps and a dashboard to track what crimes were taking place across the county.



The Sheriff's Office is finding new ways to use GIS in analyzing crime data in dashboards.

Data sharing among county departments has also been growing over time; for example, the Sheriff's Office has accessed data on licenses for day care providers and matched those data with the location of sex offenders. Another county software system that has been integrated with GIS is a customer relationship management (CRM) system maintained by the departments of Land Management, Environmental Services, and Planning and Water Management. The CRM system is used to track progress with permits issued in the county. The Assessor's Office links GIS parcel data layers with assessment data for calculating property values.

And once again, people are always thinking of different applications that could be developed. A new dashboard enables the county to share taxation impacts on properties with elected officials and other community leaders. Public Works is working on building dashboards to share performance metrics with management staff.

Regional Collaboration

Since geographic data do not end at governmental boundaries, GIS technology lends itself well to regional collaboration. The more geospatial data that are collected and available for analysis, the greater the understanding of how decisions can affect a region. In 2009, county leaders decided to invest in a small government enterprise agreement (EA) to expand GIS further across departments

without the annual budget constraints. Shortly after the EA went into effect, Esri introduced ArcGIS Online as a complimentary service to small local governments with an EA. The EA enabled the county to expand access to GIS without having to manage more desktop licenses. The county received 250 accounts for ArcGIS Online, more than enough to provide county personnel as well as city staff with access to the software.

One outcome of more widely available GIS technology is the opportunity for the county to offer ArcGIS Online to the cities. Six cities – Chaska (population 25,000), Chanhassen (population 24,000), Waconia (population 11,500), Victoria (population 8,500), Watertown (population 4,200), and Norwood Young America (population 3,700) – took advantage of the opportunity and invested in the new technology. Without any major limitations on who could or couldn't have a user license, the county was able to make GIS technology available to nearly everyone who needed or wanted the software. This arrangement was especially beneficial for the cities, which had limited access to desktop and web-based GIS and could not have otherwise taken advantage of the technology.

City Applications

The collaborative environment that exists between the county and the cities has benefited all the jurisdictions involved. As already noted, it has provided cities with GIS expertise and other resources they couldn't afford on their own. Allison Kampbell, a GIS specialist whose position is shared between the county and the cities, notes, "It's just a matter of identifying the right person in each city who can help others understand the benefits of GIS."

Utility data proved to be a driving force in the expansion of GIS technology to cities. Data updates were done once a year, but field crews wanted more up-to-date data. GPS units can capture utility data with one- to three-foot accuracy. Moreover, engineers and consultants are not needed to maintain city data at this stage as city staff have been trained to do so. Having easy access to and the ability to maintain these data on their own is a huge asset for cities.

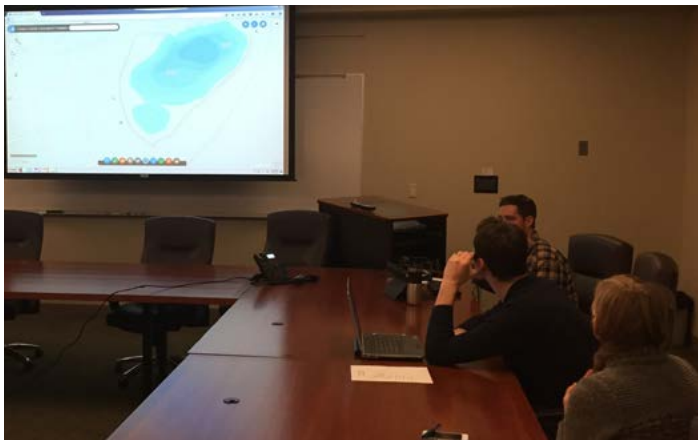
The ability to collect housing data has simplified processes for the city of Waconia. Waconia has rental housing it must manage. Converting the work flow to an in-house digital system has enabled the city to more efficiently maintain its housing data. In Norwood Young America, snow-plowing records that used to be kept in a spreadsheet are now kept in GIS.

The county has the server capacity and space available to function as a data repository for its cities. When the county installed a new fiber line in 2013, it enabled the cities to directly access their data as well as whatever live county data they might need. The intention is to move away from static maps by maintaining live data. While paper maps serve a purpose, the county has become much more dependent on technological applications.

Training and Peer-to-Peer Sharing

Despite the large growth in GIS users, the need for formal training has been minimal. Most training is handled internally within departments and is primarily focused on teaching staff how to collect data for the technology. For this purpose, the county and cities have taken advantage of both online courses offered by Esri and classroom training available locally.

The county holds a GIS users' group meeting every quarter. The cities hold their own separate quarterly meetings as well. During these meetings, power users demonstrate new apps they have developed and distribute help sheets for users to reference later on if they need additional information. For example, a power user in Water Management built a story map that other departments can adapt for their own purposes.



During monthly GIS team meetings, staff share the apps they've developed for their work.

Public Applications

Development and GIS Supervisor Peter Henschel estimates that 80 percent of the GIS applications developed are for internal use, with the remaining 20 percent available for external or public purposes. The most popular externally facing app is the county's public property map, which receives 13,000 visits a month. Story maps are another recent innovation; along with maps, citizens can access

"The sky is the limit with what GIS can offer," says GIS Analyst Nate Christ.

text, images, and multimedia content to tell a story. The Planning and Water Management Department has used this tool to convey information on water quality in county lakes and rivers, while the county is exploring new ways of making water quality data available to the public.

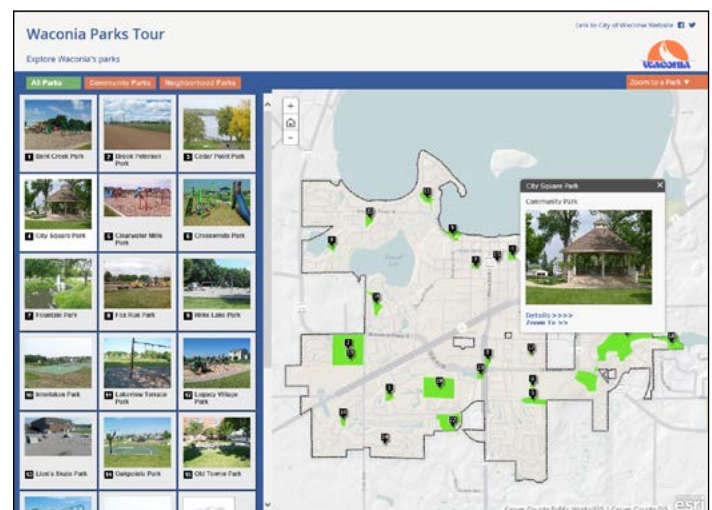
There are increasingly more applications being developed for the public. An open data portal, for instance, enables citizens to access county property and recreation data. The cities especially like to have "live" applications for zoning, trails, shopping, and electric service providers.

Benefits

The day-to-day use of GIS applications can be seen in nearly every department. While the county has not conducted any formal return-on-investment assessment, the Assessor's Office reports that, despite a doubling in the number of land parcels in the county as well as an increase in the number of inspections that must be performed, it has not created any new staff positions in the past ten years. Essentially, every system that was paper based is now handled digitally.

To recap, the county has identified the following benefits as a result of its widespread adoption of GIS:

- There is a greater sharing of data between the county and the cities.



Residents in Carver County have easy access to maps of recreational trails throughout the county.



The Water Management and Planning Department was among the first to use mobile apps for collecting water quality data while in the field.

- The cities have the benefit of an enterprise architecture that they would not be able to afford on their own.
- The cities pay a portion of the GIS system costs based on their population size, which amounts to significantly less than paying for a desktop system.
- New applications that can be used with a tablet or smartphone provide crews with instant access to data while they are working in the field.

Challenges

While there are benefits to being at the forefront of using new technology, early adoption of any new technology comes with challenges – gaps and limitations that require troubleshooting to resolve. In that sense, there have been challenges to opening up GIS technology to the whole county organization. Developing the system architecture in order to integrate different software solutions with GIS took time. This challenge occurs every time an application is upgraded.

Acknowledgment: ICMA would like to thank Carver County, Minnesota, for its contribution of photographs and other graphics used in this case study.

“We’ve generated support up and down the line for GIS,” says Peter Henschel.

One of the primary challenges has been managing the rate of expansion. The growth and demand for services can outpace available staff time, budget, and the ability to delivery services and provide necessary system security. Moreover, not all GIS users have technical know-how. Thus, with limited technical staff, there can be challenges in both managing and maintaining the system.

Advice

Support from top leadership is crucial. In Carver County, leaders have been shown the value of GIS for management and administrative purposes. The GIS Department has made every effort to help county personnel understand that the technology is not just for making maps. In fact, only 5 percent of what it does is making maps.

Methodology

The author conducted individual interviews with personnel from Carver County, Minnesota. A standardize set of interview questions guided the discussions. The author used a conversational interviewing technique to more fully explore the participants’ experiences and perceptions of the GIS program. The interview was tape recorded and reviewed in compiling notes for this report. The author sought written permission prior to attributing quotes to the individuals interviewed. The author wishes to thank the Carver County for taking the time to discuss its GIS program. Its contribution to the study was invaluable.

Study Participants

Peter Henschel, *Development & GIS Supervisor*

Perry Clark, *Asset Manager – Public Works*

Nate Christ, *GIS Analyst*

Charlie Sawdey, *Water Resources Program Specialist, Planning & Water Management*

Nate Kabat, *Planner, Planning and Water Management*

Allison Kampbell, *GIS Specialist*

About Esri

Esri inspires and enables people to make a positive impact on the future through a deeper geographic understanding of the changing world around them. Our technology enables organizations to create responsible and sustainable solutions to problems at local and global scales. At Esri, we believe that geography is at the heart of a more resilient and sustainable future. Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet.

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About ICMA

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